DOCUMENT RESUME

ED 150 646 CS 501 972

AUTHOR Nelson, Audrey A.
TITLE Developmental Trends in the Sex Differences of Proxemic Behavior.
PUB DATE Nov 77
NOTE 39p.; Paper presented at the Annual Meeting of the Western Speech Communication Association (Phoenix, Arizona, November 1977) ; Document may not reproduce clearly due to print quality

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Age Differences; *Behavior Development; *Body Language; Child Psychology; Elementary School Students; Junior High School Students; *Nonverbal Communication; *Proximity; *Sex Differences; Social Behavior

ABSTRACT

In order to investigate developmental trends in the sex differences of two dimensions of proxemic behavior, distance and shoulder orientation, 406 elementary and junior high school students were studied while interacting in same-sex and heterosexual pairs. After engaging in discussion for one minute, the pairs were asked to stop and hold still while the physical distance between them was measured and the angle of shoulder orientation recorded. The findings revealed that: (1) Older children maintained greater distances than younger children (adult standards in distance behavior seem to emerge after age 12); (2) No consistent pattern of sex differences between the female/female and the male/male dyads emerged until the sixth and seventh grades, and heterosexual dyads employed greater distances than same-sex dyads; and (3) No consistent development in shoulder orientation in same-sex and heterosexual dyads was observed, but heterosexual dyads did maintain a less direct shoulder orientation than same-sex dyads. These findings provide partial support for the adult model of distance and shoulder orientation behavior, but further research is needed to determine the ages at which various aspects of the adult standards emerge. (CC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

ED150646

Developmental Trends in the Sex Differences of Proxemic Behavior

Audrey A. Nelson

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Audrey A. Nelson

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

University of Colorado

Western Speech Communication Association

November, 1977

CS501972

This study assesses the affects of sex differences on two dimensions of proxemic behavior: distance and shoulder orientation. Purnell (1976) observed that scholars "have only recently begun to recognize the more ubiquitous and, perhaps, more subtle impact of sex roles upon communication" (p. 111). She further suggested that sex role behavior often causes misunderstanding and conflict in communication. Investigators have begun to assess the influence of sex-related rules upon verbal behavior. For example, Key (1975) and Lakoff (1975) demonstrated that a variety of syntactic and lexical features of female speech are governed by sex related rules. This emphasis on the verbal products of sex-related behavior is generally consistent with the traditional focus on the spoken and written word. Mortensen (1972) suggested that "this over emphasis on verbal signs has caused the richness and subtlety of the nonverbal mode to remain, by comparison, unexplored territory" (p. 209). Leathers (1976) emphasized the same point: "The verbal communication system has been seen as the dominant and the nonverbal communication system as subordinate" (p. 8). The major point to these arguments is that communication does not consist of words alone. The nonverbal systems of communication are an integral part of the total communication process.

An important subsystem of nonverbal communication is proxemics, the way people use and structure space. Hall

(1959) emphasized that: ". . . spatial changes give a tone to a communication, accent it, and at times even override the spoken word. The flow and shift of distance between people as they interact with each other is part and parcel of the communication process" (p. 204). Eye-contact and touch, while important components of proxemic behavior, are contingent upon physical distance and the orientation of the body. The opportunities for tactile communication obviously decrease with increases in the physical distance among communicators. Similarly, Mehrabian (1968) has demonstrated that eye-contact is directly related to the body orientation of communicators. Clearly, therefore, physical distance and shoulder orientation are the proxemic behaviors of fundamental significance. The primary focus of proxemic research has been the physical distance employed in human interactions. However, shoulder orientation has recently attracted more attention. According to Mortensen (1972):

> . . . the problem of physical orientation is a good deal more complex than the matter of . . . sheer physical distance . . . . People, after all, orient themselves . . . some complications are more characteristic of physical orientation than of the narrower concern with distance. (p. 293)

In other words, body orientation is often a source of confusion or conflict in communication interactions. The "narrower concern" with physical proximity often diverts

attention from the fundamental source of trouble in these interactions. Physical orientation is a more complex dimension of behavior and has a greater impact upon interpersonal communication processes than physical distance. In addition to the significant effects which physical orientation has upon interpersonal interactions, Hall (1966) suggested that the way people position themselves in interacting may cause misunderstandings in cross-cultural and sub-cultural encounters. In summary, both distance and the more complex dimension of physical orientation can act as barriers to communication.

In recent years, experimental research has explored the development of patterns of proxemic behavior. However, the apparent necessity for further research in proxemics has not resulted in corresponding increases in the number of studies. Evans and Howard (1973) in a review of proxemic research claimed that "very little research has been reported which explores the developmental aspects of personal space" (p. 335). More recently Wood (1976) stated that "little information about zones of territory for adults is available, but even less information is available regarding children" (p. 237). The need for additional exploratory research in the development of proxemic behavior has been the topic of numerous recent publications (Evans & Howard, 1973; Jones, 1971; Vine, 1973; Wood, 1976).

Any research into the development of distance and shoulder orientation behavior must account for the variables known to affect these important phenomena. One variable that influences distance and shoulder orientation is sex. Much empirical and theoretical consideration has been given to this variable in adult behavior, but seldom has the role of sex in the development of distance and shoulder orientation been considered. Further investigation is merited in this area.

Knowledge about the development of sex difference in distance and shoulder orientation will provide a developmental basis for the standards employed by adults. As Wood (1976) suggested, "When we understand more about a child's acquisition of proxemic behavior, our understanding of adult norms will be more meaningful" (p. 244). The study of age-correlated changes will aid in a developmental schema of adult behavior.

While other variables, such as status, similarity of attitude, personality traits, and culture have been shown to affect distance and shoulder orientation, they are either situational and/or personality linked and will not affect the general developmental trends sought in this study.

Before examining the research on the development of sex differences in distance and shoulder orientation, it is important to review research employing adults. The starting point will be to formulate an adult model. This model will

serve as a basis for comparison for children's distance and shoulder orientation behavior.

Sex Differences in Adult Distance and Shoulder Orientation

There is a great deal of evidence that women interacting with women exhibit closer spatial relation than males interacting males (Garfinkel, 1964; Horowitz, Duff & Stratton, 1970; Lott & Sommer, 1967; Pellegrini & Empey, 1970; Sommer, 1959; Willis, 1966).

The research concerning heterosexual pairs suggests that in general, heterosexual pairs have smaller distance zones than same-sex pairs. For example, studies conducted by Kuethe and his associates (Kuethe, 1962; Kuethe & Stricker, 1963; Kuethe & Weingartner, 1964) consistently found that male-female pairs were placed closer together than male pairs or female pairs. Hartnett, Bailey and Gibson (1970) found that male subjects who scored high on heterosexuality tests maintained closer personal space zones with female subjects than with male subjects. Baxter (1970) in a study of 859 subjects from Black, Anglo, and Mexican-American groups also discovered that "male-females interacted most proximally and male-male pairs were the most distant" (p. 456). Evans and Howard (1973) summarized the research findings on sex differences in distance behavior as follows: "Male-female pairs require less personal space

than female-female pairs who in turn require less than male-male pairs" (p. 337).

Mehrabian (1968) suggested that amount of eye-contact is associated with directness of shoulder orientation. Research reveals that males maintain less eye-contact than females (Argyle, 1967; Argyle & Dean, 1965; Exline, 1963; Exline, Gray, & Schuette, 1965) which suggests that they may also be less direct in shoulder orientation. Jones (1971) found this to be true among adults of four ethnic-racial groups. In other words, regardless of subcultural group, women were found to be more direct in shoulder orientation than men.

Sex differences in adult distance and shoulder orientation behavior can be summarized as follows:

1. Women interact with women at closer distances than males interact with males.

2. Male-female pairs interact at closer distances than same-sexed pairs.

3. Women are more direct than men in shoulder orientation.

The composite of adult distance and shoulder orientation behavior summarized above will serve as a model of mature behavior. This model will serve as a basis of comparison of children's development of sex differences in distance and shoulder orientation behavior.

Children's Distance and Shoulder Orientation Behavior

Current studies relating to the development of sex differences in children's distance and shoulder orientation behavior require attention. Markey (1971) investigated the proxemic patterns of children between the ages of 6 and 14. Specifically, he wanted to determine if interaction patterns that develop ontogentically were influenced by sex, or affected by the perceived relationships between the interactants. Employing a simulation method, the study revealed that both boys and girls placed figures similarly. In summary, Markey (1971) found no sex differences in the patterning of interactions at any age between 6 and 14.

Meisels and Guardo (1969; 1971) conducted two studies with children in grades 3 through 10. The first study employed a paper-pencil measure which revealed that both sexes place themselves closer together to same-sex pairs than mixed-sex pairs in earlier grades. In later grades, mixed-sex pairs interacted at closer distances. The second study (Meisels & Guardo, 1971) revealed that girl's spatial patterns were more determined by the emotional tone of the interaction than the sex of the stimulus figure. Specifically, Meisels and Guardo (1971) found that from 3rd through 10th grade, girls choose greater distances than boys in negative affect situations. Similar results were found in another study by Guardo (1976). Employing the simulation

technique, the study investigated the personal schemata for several interpersonal situations of 6th graders. Boys were found to be attracted to vigorous and assertive peers and moved away from apprehensive peers. Girls, in contrast, were drawn toward "tender minded" peers and were distant with phlegmatic ones. Generally, these studies suggest that boys are expected to show less fear and girls are allowed to experience and demonstrate more intimacy. Another study by Stern and Bender (1974) does not support the contention that girls stay farther away from a strange or threatening person. It should be noted that this study employed direct observation of behavior rather than a simulation method.

In summary, the studies by Meisels and Guardo (1969; 1971) and Guardo (1976) generally reveal consistent developmental trends in distance behavior. In contrast, a recent study by Pedersen (1973) found few consistent monotonic developmental trends. Pedersen devised a simulation measure called the Pedersen Personal Space Measure (PPSM) which was devised to calculate children's (1st through 6th grade) personal space toward four stimulus persons: man, woman, boy, and girl. The study revealed that the mean distances employed by males was larger. However, for the 1st and 6th grades, females had larger means than males for those two grades. As Pedersen (1973) suggested, "A consistent downward trend in personal space for females

increased to approximately the same distance as for male 6th graders" (p. 3).

Shoulder orientation has not been included in many studies of children's proxemic behavior. Results of studies of shoulder orientation have yielded contradictory findings. Aiello and Jones (1971) in a field study of school children (1st and 2nd grade) found that males were more direct than girls in shoulder orientation. A second study by Aiello and Jones (1973) yielded results consistent with adult norms, girls were more direct in shoulder orientation than males. The results of a study conducted by Guenther and Mills (1976) found no sex differences in shoulder orientation of 42 children at the mean age of 5.8 years. These studies suggest that the relationship of sex to shoulder orientation observed among adults probably emerges at some time after six years of age.

On the basis of the preceding discussions it is clear that the study of distance and shoulder orientation behavior lacks a developmental base. This may be a function of the absence of empirical investigation and the questionable real-life validity of the simulation techniques employed by most developmental studies. Porter, Argyle and Salter (1970) suggested that "many studies used very artificial methods of doubtful validity such as asking subjects to move cardboard cut-outs . . ." (p. 40). Hasse (1970) argued that placing felt figures is a projective task which

masks the actual sex differences that might appear in a live situation. In contrast to studies previously described, this study is a cross-sectional study involving the observation of a large number of subjects engaged in real life interaction. Additionally, this study will investigate shoulder orientation, a previously neglected proxemic variable.

In view of the conceptual and methodological shortcomings of previous research, additional research is needed in the area of developmental trends in proxemic behavior. The following research questions will be posed: (1) What is the relationship of age to the distance employed by females in the interactions of same-sex pairs? (2) What is the relationship of age to the distance employed by males in the interactions of same-sexed pairs? (3) What is the relationship of age to the distance employed by heterosexual pairs? (4) What is the relationship of age to the shoulder orientation employed by females in same-sexed pairs? (5) What is the relationship of age to the shoulder orientation employed by males in same-sexed pairs? (6) What is the relationship of age to the shoulder orientation employed in heterosexual pairs? (7) What is the relationship of age and the composition of the dyads to the distance employed? (8) What is the relationship of age and the composition of the dyads to the shoulder orientation employed?

Method

Subjects

The subjects for the present study were 406 pupils enrolled at a municipal elementary and junior high school. One hundred and thirty-eight males participated in the male-male dyads and 134 females participated in the female-female dyads. Sixty-seven males and 67 females participated in the male-female dyads. The subjects were randomly selected from first through seventh grade. Table 1 depicts the number of each type of dyad and the total number of subjects at each grade level. Subjects were predominantly middle-class whites.

Table 1

The Number of Each Type of Dyad and the Total of Subjects at Each Grade Level

	1	2	3	4	5	6	7
Male-male	10	10	10	10	10	9	10
Female-female	10	10	9	9	10	9	10
Male-female	10	10	9	9	10	9	10
Total	60	60	56	56	60	54	60

The study was conducted during a three-week period in the month of March. At this point in the year, the mean age of the children at each level was first grade, 6 years and

5 months; second grade, 7 years and 5 months; third grade, 8 years and 2 months; fourth grade, 9 years and 3 months; fifth grade, 10 years and 4 months; sixth grade, 11 years and 4 months; and seventh grade, 12 years and 5 months.

Procedure

The procedure will be discussed first by describing data collection in the experimental conditions. Then the measurement employed and the data analysis will be presented.

Testing

In order to facilitate interaction in the dyads, teachers in each class were asked to pair the subjects with someone whom they would normally choose as a partner for class activities. A similar approach was used by Aiello and Jones (1973). This procedure was adopted to control the degrees of friendship in the dyads.

The subjects were escorted in pairs to rooms that are employed for out-of-class activities. Two experimenters were seated at a desk. The subjects were instructed to stand in a designated part of the room within viewing distance of the judges. The pair delivered the following instructions to the subjects:

> We are two college students who are interested in finding out about children's favorite television programs. We would like you to discuss your favorite programs and

decide upon the best one. You will have five minutes to make a decision. We will tell you when your time is up.

Generally, subjects were enthusiastic when reporting their favorite programs to the experimenter, suggesting that the children accepted the task.

Measurement

The scoring of distance and shoulder orientation was recorded one minute after initial interaction was established between the dyads. The one minute interim was allowed in order that the subjects could be interacting comfortably. At that one minute point in the interaction, the subjects were asked to stop and hold still.

The physical distance between the dyads were measured. Judges marked the distance employed by the dyads and then recorded the measurement to the nearest inch. Similar techniques have been employed to measure body buffer zones in adults (Horowitz et al., 1964) and approach distance with children (Stern & Bender, 1974).

Scoring of shoulder orientation was derived from the studies on children by Aiello and Jones (1971; 1973) and Jones (1971). These studies modified Hall's (1963) schemata. Shoulder orientation was conceived as hours on a clock. For example, as shown in Figure 1, a 0 is a direct high-noon relationship. A 1 1/2 or (1:30) position represents a

shoulder orientation with a slight angle: one person is parallel to the long hand of a clock pointing to 12, and the person facing him/her is parallel to the short hand pointing halfway between the 1 and 2. A side-by-side position is a 6. The raw scores are transferred into numerical values. For example, a direct high-noon position is a 0; a 1:30 is 1.5; and a side-by-side is a 6.

Judges were trained in the use of the scales. Two judges scored the subject's shoulder orientation. Previous studies (Aiello & Jones, 1971; 1973; Jones, 1971) have demonstrated that this method results in high inter-judge reliability, both in laboratory and field conditions. A Pearson product-moment correlation was performed to assess the inter-judge reliability of the judges' scores. The *r* obtained was +.93, demonstrating high inter-judge reliability.

Data Analysis

Analyses of variance for the distance and shoulder orientation scores from the same-sex dyads and the heterosexual dyads were conducted. Significant ANOVA scores were further analyzed by employing *t*-tests between each grade level and to determine which of the grade steps significantly differed. A two-way analysis of variance for the distance and shoulder orientation scores were conducted for the two same-sex dyads. Analyses of variance for

distance and shoulder orientation were conducted for the two same-sex dyads and the heterosexual dyads. The .05 level was required for all tests of significance. An omega squared was performed on the *F* test results to determine the proportion of the total dependent variable variance attributed to the independent variable. Cohen (1969) suggested that *F* test results that explain 14% of the variance can be considered to have explained a large amount. Omega squared results will be compared to this criteria.

Results

Eight research questions were posed in the present study. The first three questions were concerned with the relationship of age to the distance employed by three different dyads: male-male, female-female, and male-female. Research questions 4, 5, and 6 were addressed to the relationship of age to the shoulder orientation employed by the three different dyads. These questions pertained to the maturation of distance and shoulder orientation behavior. Research question 7 was addressed to the relationship of age and composition of the dyads to the distance employed. Research question 8 was concerned with the relationship of age and the composition of the dyads to the shoulder orientation employed.

The results of the study will be presented first with a discussion of the Research Questions addressed to

distance (1, 2, 3, and 7) and then the Research Questions addressed to shoulder orientation (4, 5, 6, and 8).

Distance

Research Question 1

The first research question addressed the relationship of age to the distance employed by females in the interactions of same-sex dyads. A one-way ANOVA was undertaken to assess the effects of age on the distance employed by female-female pairs. The results summarized in Table 2 were significant ($F = 6.46$, df 6/60, $p < .05$), indicating a significant impact of age on distance in female pairs. An

Table 2

Analysis of Variance: Female-Female Distance Scores[a]

Source	*SS*	*df*	*MS*	*F*
Grade level	1491.41	6	248.6	6.46*
Error	2309.59	60	38.5	
Total	3801.00	66		

[a] $N = 67$.

*$p < .05$.

omega squared was performed on the F test results to determine the proportion of the total dependent variable variance attributed to the independent variable. The coefficient (W^2)

obtained was .20, indicating that a large amount of the dependent variable is accounted for by the independent variable. Further analysis of the data was conducted to determine which of the individual grade steps were significant. Raw distance scores between each grade level were analyzed by *t*-test for independent means. The *t* value obtained between the 5th and 6th grade (2.20, 17 *df*) was statistically significant. The means for all grade levels are presented in Table 3.

Table 3

Mean Distance Scores for Male-Male, Female-Female, and Male-Female Dyads at each Grade Level[a]

	1	2	3	4	5	6	7
Male-male	5.80	6.45	6.80	14.0	6.20	16.44	15.7
Female-female	6.40	5.90	8.44	9.9	8.60	12.78	13.2
Male-female	10.60	9.60	26.00	18.8	14.80	36.00	22.7

[a]The raw scores are the number of inches.

Research Question 2

The second research question addressed the relationship of age to the distance employed by males in the interactions of same-sex pairs. A one-way ANOVA was conducted to assess the effects of age on the distance employed by male-male dyads. The results summarized in Table 4 yielded

significant results (F = 2.21, df 6/62, p < .05), indicating a significant impact of age on distance employed in male pairs. An omega squared was performed on the test results to determine the proportion of the total dependent variable variance attributed to the independent variable. The coefficient obtained was .09, indicating that an unimportant amount of the dependent variable variance was attributed to the independent variable. Again, individual age steps were assessed by means of a t-test for independent means. The t values obtained between the 3rd and 4th grade (2.38, 18 df), 4th and 5th grade (2.62, 18 df), and the 5th and 6th grade (2.82, 17 df) were significant. The means for all grade levels are presented in Table 3.

Table 4

Analysis of Variance: Male-Male Distance Scores[a]

Source	*SS*	*df*	*MS*	*F*
Grade level	1534.1	6	255.7	2.21*
Error	7179.1	62	115.8	
Total	8713.2	68		

[a] N = 69.

*p < .05.

Research Question 3

The third research question addressed the relationship of age to the distance employed by male-female pairs. A one-way ANOVA was undertaken to assess the effects of age on the distance employed in heterosexual dyads. The results summarized in Table 5 were significant ($N = 4.31$, df 6/60, $p < .05$), indicating a significant age effect on the distance employed by male-female pairs. An omega squared was

Table 5

Analysis of Variance: Male-Female Distance Scores[a]

Source	*SS*	*df*	*MS*	*F*
Grade level	6,198.54	6	1,033.09	4.31*
Error	14,378.50	60	239.94	
Total	20,577.04	66		

[a] $N = 67$.

*$p < .05$.

performed on the F test results. The coefficient obtained was .09, indicating that an unimportant amount of the dependent variable variance was attributed to the independent variable. Individual age steps were assessed by a t-test for independent means. The t value obtained between the 5th and 6th grades (2.94, 17 df) and the 6th and 7th grade

(3.13, 17 *df*) exceeded the value required for statistical significance. Table 3 depicts the means for all grade levels.

Research Question 7

The seventh research question concerned the relationship of age and the composition of the dyads to the distance employed. A two-way ANOVA was undertaken to assess the effects of age and same-sex composition on the distance employed in male-male and female-female dyads. The results summarized in Table 6 yielded significant results (F = 25.96, < .001. *df* 1/122, $p < .05$) in the sex dimension. The age dimension yielded nonsignificant results (F = .05, *df* 6/122, $p < .05$). An omega squared was performed on the

Table 6

Analysis of Variance: Male-Male and Female-Female Distance Scores[a]

Source	*SS*	*df*	*MS*	*F*
Age dimension	24.26	6	4.04	<1
Sex dimension	1901.95	1	1901.95	25.96*
Interaction	217.18	6	36.20	<1
Error	8935.61	122	73.24	
Total		135		

[a] $N = 136$.

*$p < .05$.

proportion of the total dependent variable variance attributed to the sex variable. The coefficient obtained (W^2) was .13, indicating that a relatively unimportant amount of the dependent variable variance was attributed to the independent variable. A one-way ANOVA was undertaken to assess the effects of the composition of the dyads on the distance employed. The results summarized in Table 7 yielded significant results (F = 27.01, < .001, df 2/200, $p < .05$). An omega squared was conducted on the F test results. The coefficient of .19 was obtained, indicating that a large amount of the dependent variable variance is attributed to the independent variable.

Table 7

Analysis of Variance: Male-Male, Female-Female, and Male-Female Distance Scores[a]

Source	*SS*	*df*	*MS*	*F*
Sex composition	6092.7	2	3046.35	27.01*
Error	22556.7	200	112.78	
Total	28649.4	202		

[a] $N = 203$.

*$p < .05$.

Measurement of Shoulder Orientation

Research Question 4

Research question 4 concerned the relationship of age to the shoulder orientation employed by females in same-sex pairs. A one-way ANOVA was conducted to assess the effects of age on the shoulder orientation employed by female-female dyads. The results summarized in Table 8 yielded nonsignificant results ($F = 1.28$, df 6/60, $p < .05$). An omega squared was conducted on the F test results. The coefficient of .03 was obtained, indicating a nonsignificant amount of the dependent variable was attributed to the independent variable.

Table 8

Analysis of Variance: Female-Female Shoulder Orientation Scores[a]

Source	*SS*	*df*	*MS*	*F*
Grade level	13.17	6	2.19	1.28 n.s.
Error	102.60	60	1.71	
Total	115.77	66		

[a]$N = 67$.

Research Question 5

The fifth research question addressed the relationship of age to the shoulder orientation employed by

male-male dyads. A one-way ANOVA was conducted to assess the effects of age on shoulder orientation employed by male-male pairs. The results summarized in Table 9 yielded nonsignificant results (F = .45, < 1, df 6/60, p < .05). An omega squared was conducted on the F test results. The coefficient of .05 was obtained indicating a nonsignificant amount of the dependent variable was attributed to the independent variable.

Table 9

Analysis of Variance: Male-Male Shoulder Orientation Scores[a]

Source	*SS*	*df*	*MS*	*F*
Grade level	6.55	6	1.09	< 1 n.s.
Error	150.25	62	2.42	
Total	156.80	68		

[a] N = 69.

Research Question 6

The sixth research question addressed the relationship of age to the shoulder orientation employed by male-female pairs. A one-way ANOVA was conducted to assess the effects of age on the shoulder orientation employed by heterosexual dyads. The results summarized in Table 10

yielded nonsignificant results (F = .35, < .1, df 6/60, p > .05). An omega squared was conducted on the F test results. The coefficient of .03 was obtained indicating a nonsignificant amount of the dependent variable was attributed to the independent variable

Table 10

Analysis of Variance: Male-Female Shoulder Orientation Scores[a]

Source	*SS*	*df*	*MS*	*F*
Grade level	5.71	6	.95	< 1 n.s.
Error	160.69	60	2.68	
Total	166.40	66		

[a] N = 67.

Research Question 8

Research question 8 was concerned with the relationship of the age and the composition of the dyads to the shoulder orientation employed. A two-way ANOVA was performed to determine the effects of age and same-sex composition on the shoulder orientation employed in male-male and female-female dyads. The results summarized in Table 11 yielded nonsignificant results for the grade dimension (F = 2., < .1, df 6/122, p > .05) and the sex dimension (F = 3.52, df 1/122, p > .05). A one-way ANOVA was

Table 11

Analysis of Variance: Male-Male and Female-Female Shoulder Orientation Scores[a]

Source	*SS*	*df*	*MS*	*F*
Age dimension	21.59	6	3.60	2.00 n.s.
Sex dimension	6.35	1	6.35	3.52 n.s.
Interaction	.18	6	.03	< 1.00 n.s.
Error	224.40	122	1.80	
Total		135		

[a] $N = 136$.

undertaken to assess the effects of the composition on the dyads on the shoulder orientation employed. The results summarized in Table 12 yielded significant results

Table 12

Analysis of Variance: Male-Male, Female-Female, Male-Female Shoulder Orientation Scores[a]

Source	*SS*	*df*	*MS*	*F*
Sex composition	37.70	2	18.50	9.10*
Error	413.54	200	2.07	

[a] $N = 203$.

*$p < .05$.

($F = 9.10$, df 2/200, $p < .05$). An omega squared was performed on the F test results. The coefficient of determination (W^2) obtained was .07, indicating that not much of the dependent variable variance was attributed to the independent variable. The means of shoulder orientation scores for all grade levels is presented in Table 13.

Table 13

Mean Shoulder Orientation Scores for Male-Male, Female-Female and Male-Female Dyads at Each Grade Level

	1	2	3	4	5	6	7
Male-male	.60	1.38	1.48	1.03	.80	1.03	1.80
Female-female	1.36	.55	1.24	.42	1.15	1.14	.25
Male-female	1.15	1.95	2.95	1.40	1.38	1.53	1.60

The Use of Distance

The significant results obtained in Research Questions 1, 2, and 3 indicate maturational development of distance behavior in same-sex and heterosexual dyads. In general, the findings revealed that children in higher grades interacted at greater distances than children in the lower grades. This finding suggests that distance behavior displays developmental trends.

Specifically, members of the 6th grade female-female dyads interacted at significantly greater distances than members of the 5th grade. Similar results were obtained by Pedersen (1973). His study revealed "a sharp increase in the mean personal space distance of sixth grade females" (p. 7). As Pedersen stated, "An understanding of this result must await further investigation of the dynamics of the social milieu of sixth grade girls" (p. 7). Interaction between male-male pairs revealed that 4th grade males interact in significantly greater distances than 3rd grade males. Additionally, results revealed that 5th grade males interacted in significantly less distance than 4th grade males. Finally, results revealed that 6th grade males interacted in greater distances than 5th grade males. Generally, a significant acceleration of the trend toward greater distance employed occurred between the 3rd and 4th grade. The statistically significant reduction in distance employed by 5th grade males may be artifacticious. The obtained mean was affected by three considerably low scores.

These findings for males contradicts the developmental trends reported by Pedersen (1973). Pedersen found that significant distance changes occurred only between the 2nd and 3rd grade.

Male-female dyads increased interaction distances significantly between the 5th and 6th grade and significantly reduced distance between the 6th and 7th grade.

Research Question 7 concerned the relationship of the composition of the dyads and age to the distance employed. The findings revealed a significant sex effect and a nonsignificant age effect in distance behavior. These results contradict previous research. Markey (1971) conducted a study to determine if patterns of proxemic behavior emerge ontogenetically, are influenced by sex, or are affected by the perceived relationship between the interactants. His study reported a significant grade effect and a nonsignificant sex effect. Specifically, both boys and girls (the study employed a simulation method) placed figures similarly and older subjects, regardless of sex, tended to place more distance between the figures. As suggested earlier, a possible explanation for the nonsignificant sex effect could be the projective measure operating to mask the actual sex differences in "real-life" situations. In other words, in a live interaction measure, the subjects are exposed to the sexual aspects of the stimuli, whereas a simulation method minimizes "real-life" sex cues.

In reference to the development of sex differences in the distance employed by the dyads, several conclusions can be drawn from the present study. There were no constant sex differences between the same-sex dyads until the 6th grade. Female same-sex pairs maintained greater distances

than male same-sex pairs in the 1st, 3rd, and 5th grade. Male same-sex dyads maintained greater distances than female same-sex dyads in the 2nd, 4th, 6th, and 7th grades. These results suggest that there are no consistent developmental relationships between the same-sex dyads until 6th and 7th grade. A study of older children might reveal that the differences observed between the same-sex dyads remained constant after the 7th grade. In other words, a consistent developmental pattern of sex differences in the distance employed by the same-sex dyads did not emerge until 6th and 7th grade. The distance behavior observed between same-sex dyads at the 6th and 7th grade was consistent with the adult model: male-male pairs interacted at greater distances than female-female pairs.

The distance employed by heterosexual dyads did not conform to the adult model. Heterosexual dyads maintained greater distances than same-sex dyads at each grade level. This finding suggests that there is a partial development of the sex differences in distance behavior. Specifically, by the 7th grade (mean age 12 years and 5 months), heterosexual pairs had failed to reach adult standards. As Evans and Howard (1973) suggested, "children develop spatial norms which have a regular sequence, with the onset of normal personal space at about age 12" (p. 336). Another possible explanation of the distance behavior of the heterosexual

pairs is that children in this age range have not yet developed interpersonal attractions for the opposite sex. As McCandless (1969) suggested:

> Until about adolescence for girls and probably into adolescence for boys, the same-sex peer group is the principal arena within which the child develops his peer-influenced socialization. . . . There seems to be relatively little cross-sex influence . . . . (p. 809)

Inkeles (1969) remarked that "a central feature of the period of late childhood and adolescence" is the increasing importance of "managing mature heterosexual relations" (p. 625). In addition, he claimed that this period is marked by a change in relations to the opposite sex.

In summary, the findings revealed the following developmental trends in the sex differences of distance behavior: (1) a consistent pattern of sex differences between the female-female and the male-male dyads did not emerge until 6th and 7th grade; (2) heterosexual dyads maintained greater distances than same-sex dyads at each grade level. In addition, same-sex and heterosexual dyads interacted in greater distances in the higher grades. The adult model of distance behavior is partially represented within the age range tested in the present study. Inconsistent with adult standards, the heterosexual dyads interacted at greater distances than the same-sex dyads, suggesting that

this pattern of behavior emerges after age 12. Same-sex dyads exhibited inconsistent patterns until the 6th and 7th grade: male-male dyads maintained greater distances than the female-female dyads, which is similar to adult norms.

The Use of Shoulder Orientation

Research Questions 4, 5, and 6 addressed the relationship of age to the shoulder orientation employed by same-sex and heterosexual dyads. The failure to find significant results suggests that there is no consistent maturational progress in shoulder orientation behavior. In addition, Research Question 8 was concerned with the relationship of age and composition to the dyad to the shoulder orientation employed and the results yielded no significant differences between the shoulder orientation of male-male and female-female pairs. This finding contradicts previous research. Aiello and Jones (1973) conducted a study which revealed that by fifth grade, males were less direct than females in shoulder orientation. The only significant finding in shoulder orientation behavior was between the same-sex and heterosexual dyads. Heterosexual dyads were the most indirect in shoulder orientation at each grade level with the exception of 1st grade (females were the most indirect) and the 7th grade (males were the most indirect).

One explanation for the absence of significant sex differences and maturational patterns in shoulder orientation is that this behavior may emerge after age 12. Another explanation is that research basis of adult shoulder orientation is tenuous. That is, there has been little empirical research to suggest sex differences in the directness of the body. The model of shoulder orientation sex differences presented here is based upon Mehrabian's observation that eye-contact is related to shoulder orientation. Further research is needed to develop a more comprehensive adult model of shoulder orientation behavior.

Summary

The present study investigated the developmental trends in the sex differences of proxemic behavior. The proxemic variables studied were distance and shoulder orientation. Generally, the findings revealed significant maturational development in distance behavior, that is, older children maintained greater distances than younger children. Specifically, a consistent pattern of sex differences between the female-female and the male-male dyads did not emerge until the 6th and 7th grade. Furthermore, heterosexual dyads employed greater distances than same-sex dyads. These results suggest that adult standards in distance behavior may emerge after age 12.

The results indicated that there is no consistent development in shoulder orientation in same-sex and heterosexual dyads. However, the results did indicate a difference in shoulder orientation among the dyads. Generally, heterosexual dyads maintained a less direct shoulder orientation than same-sex dyads. In addition, there were no sex differences among female-female and male-male dyads.

The findings provided a partial support of the adult model for distance and shoulder orientation behavior. Further research is needed to determine the ages at which various aspects of the adult standards emerge.

References

Aiello, J., & Jones, S. Field study of the proxemic behavior of young school children in three subcultural groups. *Journal of Personality and Social Psychology*, 1971, *19*, 351-356.

Aiello, J., & Jones, S. Proxemic behavior of black and white first, third, and fifth grade children. *Journal of Personality and Social Psychology*, 1973, *25*, 21-27.

Argyle, M. *The psychology of interpersonal behavior*. Baltimore: Penguin Books, 1967.

Argyle, M., & Dean, J. Eye-contact, distance, and affiliation. *Sociometry*, 1965, *28*, 289-304.

Baxter, J. C. Interpersonal spacing in natural settings. *Sociometry*, 1970, *33*, 444-456.

Cohen, J. *Statistical power analysis for the behavioral sciences*. New York: Academic Press, 1969.

Evans, G. W., & Howard, R. B. Personal space. *Psychological Bulletin*, 1973, *80*, 334-344.

Exline, R. V. Explorations in the process of personal perception: Visual interaction in relation to competition, sex, and need for affiliation. *Journal of Personality*, 1963, *31*, 1-20.

Exline, R. V., Gray, D., & Schuette, D. Visual behavior in a dyad as affected by interview content and sex of respondent. *Journal of Personality and Social Psychology*, 1965, *1*, 201-209.

Garfinkel, H. Studies of the routine grounds of everyday activities. *Social Problems*, 1964, *11*, 225-250.

Guardo, C. J. Personal space, sex differences, and interpersonal attraction. *Journal of Psychology*, 1976, *92*, 9-14.

Guenther, A., & Mills, P. *The relationship of cognitive style to language acquisition and selected aspects of nonverbal communication*. Paper presented at the Western Speech Communication Association Convention, San Francisco, November, 1976.

Haase, R. F. The relation of sex to the regulation of interpersonal interaction distance in counseling analogue. *Journal of Counseling Psychology*, 1970, *17*, 233-236.

Hall, E. T. *The silent language*. Greenwich, Conn.: Fawcett Publications, 1959.

Hall, E. T. A system for the notation of proxemic behavior. *American Anthropologist*, 1963, *65*, 1000-1026.

Hall, E. T. *The hidden dimension*. New York: Doubleday, 1966.

Harnett, J. J., Bailey, K. G., & Gibson, F. W. Personal space as influenced by sex and type of movement. *Journal of Psychology*, 1970, *76*, 139-144.

Horowitz, M. J., Duff, D. F., & Stratton, L. O. Personal space and the body buffer zone. In H. M. Proshansky, W. H. Ittleson, & L. G. Rivlin (Eds.), *Environmental psychology: Man and his physical setting*. New York: Holt, Rinehart & Winston, 1970.

Inkeles, A. Social structure and socialization. In David A. Goslin (Ed.), *Handbook of socialization theory and research*. Chicago: Rand McNally, 1969.

Jones, S. E. A comparative proxemic analysis of interaction in selected subcultures of New York City. *Journal of Social Psychology*, 1971, *84*, 35-44.

Key, M. R. *Male/female language*. Metuchen, N.J.: Scarecrow Press, 1975.

Kuethe, J. L. Social schemas. *Journal of Abnormal and Social Psychology*, 1962, *64*, 31-38.

Kuethe, J. L., & Stricker, G. Man and woman: Social schemata of males and females. *Psychological Reports*, 1963, *13*, 655-661.

Kuethe, J. L., & Weingartner, N. Male-female schemata of homosexual and nonhomosexual penitiary inmates. *Journal of Personality*, 1964, *32*, 23-31.

Lakoff, R. *Language and woman's place*. New York: Harper, 1975.

Leathers, D. *Nonverbal communication systems*. Boston: Allyn & Bacon, 1976.

Lott, D. F., & Sommer, R. Seating arrangements and status. *Journal of Personality and Social Psychology*, 1967, *7*, 90-95.

Markey, M. J. The ontogenesis of proxemic behavior among school-aged children. (Doctoral dissertation, University of Massachusetts, 1971). *Dissertation Abstracts International*, 1971, *32*, 1851.

McCandless, B. Childhood socialization. In David A. Goslin (Ed.), *Handbook of socialization theory and research*. Chicago: Rand McNally, 1969.

Mehrabian, A. Relationship of attitude to seated posture, orientation, and distance. *Journal of Personality and Social Psychology*, 1968, *10*, 26-30.

Meisels, M., & Guardo, C. J. Development of personal space schematas. *Child Development*, 1969, *40*, 1167-1178.

Meisels, M., & Guardo, C. J. Factor structure of children's personal space schemata. *Child Development*, 1971, *42*, 1307-1312.

Mortensen, D. *Communication: The study of human interaction*. New York: McGraw-Hill, 1972.

Pedersen, D. M. Developmental trends in personal space. *Journal of Psychology*, 1973, *83*, 3-9.

Pellegrini, R. J., & Empey, J. Interpersonal spatial orientation in dyads. *Journal of Psychology*, 1970, *76*, 67-70.

Porter, E., Argyle, M., & Salter, V. What is signalled by proximity? *Perceptual and Motor Skills*, 1970, *30*, 39-42.

Purnell, S. Sex roles in communication: Teaching and research. *Western Speech*, 1976, *40*, 111-120.

Sommer, R. Studies in personal space. *Sociometry*, 1959, *22*, 247-260.

Stern, D. N., & Bender, E. P. An ethological study of children approaching a strange adult: Sex differences. In R. C. Friedman, R. M. Richart, & R. L. Van de Wiele (Eds.), *Sex differences in behavior*. New York: Wiley, 1974.

Vine, I. The role of facial-visual signalling in early social development. In M. Cranach & I. Vine (Eds.), *Social communication and movement*. New York: Academic Press, 1973.

Willis, F. N. Initial speaking distance as a function of the speakers' relationship. *Psychonomic Science*, 1966, 5, 221-222.

Wood, B. *Children and communication: Verbal and nonverbal language development*. Englewood Cliffs, N.J.: Prentice-Hall, 1976.